Install Guide

1794sc-IF8IU

Install Guide

Important User Information
Solid state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (Publication SIC-11-1 available from your local Rockwell Automation sales office or online at http://literature.rockwellautomation.com) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Spectrum Controls, Inc. be responsible for indirect or consequential damages resulting from the use or application of this equipment.
The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with different types of equipment, Spectrum Controls, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.
No patent liability is assumed by Spectrum Controls, Inc., with respect to use of information, circuits, equipment, or software described in this manual.

Reproduction of the contents of this manual, in whole or in part, must satisfy themselves that each intended application of this equipment is acceptable.

WARNING
Installation of any equipment must be done only by trained personnel.

Do not insert or remove the module while the backplane power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

If you connect or disconnect wiring while the field side power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations.

Identifies information that is critical for successful application and understanding of the product.

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WARNING
The local power supply is non-isolated.

Do not daisy-chain power or ground from this module terminal base units.

Do not daisy-chain power to the next terminal base unit, connect a jumper from terminal 30 (+V dc) on this base unit to +V terminal on the next terminal base unit.

If daisy-chaining power to the next terminal base unit, connect a jumper from terminal 30 (+V dc) on this base unit to +V terminal on the next terminal base unit.

Install Your IF8IU Input Module

When mounting the module, be sure the backplane power is on, the is kept from falling into the module. Debris that falls into the module could cause damage on power up.

Remove the keyset (1) on the terminal base (2) to locate position 3 as required for this type of module.

Mount the module using the connector (3) and attach all the way to the left to contact the neighboring terminal base/adapter. You cannot install the module unless the connector is fully extended.

Make sure the pins on the bottom of the module are straight so they will align properly with the connector in the terminal base.

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5. If daisy-chaining power to the next terminal base unit, connect a jumper from terminal 30 (+V dc) on this base unit to +V terminal on the next terminal base unit.

If using solid junction compensators, make these connections as shown in the CJC-Sensor chart below.

- If the RTD units are color-coded, the wires that are the same color are connected together. If the wires are not color-coded, use an ohmmeter to determine the pairs as explained below.

How to Connect a 3-wire RTD

If the 3-wire RTD units are all different colors, use an ohmmeter to determine which leads are connected together. Either lead of the pair can be the compensation lead. Attach one lead of the pair to terminal 4 and the other to V+. Attach the single lead to to -.

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1. Install the module onto the 1794-TB3G or 1794-TB3GS terminal base.

2. Press firmly and evenly to seat the module in the terminal base unit. The module is secured when the latching mechanism (7) is locked into the module.

3. Connect the power supply to the +V terminal on the module.

4. Install the module within an enclosure where the ambient temperature is expected to be between 0°C and 65°C (32°F and 149°F). The enclosure must be large enough to accommodate the module and the ambient temperature must be maintained within this range.

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Wire Connections for the Isolated Universal Input Module

RTD/Resistance

Thermocouple

mV Source

mA Source

Example of RTD/Resistance Wiring to a 1794-TB3G Terminal Base Unit

Example of Thermocouple Wiring to a 1794-TB3G Terminal Base Unit

Example of Voltage Wiring to a 1794-TB3G Terminal Base Unit

Example of Current Wiring to a 1794-TB3G Terminal Base Unit

Terminal Base Unit Wiring Connections

Table: Channel Number | Signal Return (Ω) | Input + (Ω) | Input – (Ω) | Return (+) | Return (–)
--- | --- | --- | --- | --- | ---
1 | 1 | 1 | 1 | 1 | 1
2 | 2 | 2 | 2 | 2 | 2
3 | 3 | 3 | 3 | 3 | 3
4 | 4 | 4 | 4 | 4 | 4
5 | 5 | 5 | 5 | 5 | 5
6 | 6 | 6 | 6 | 6 | 6
7 | 7 | 7 | 7 | 7 | 7
8 | 8 | 8 | 8 | 8 | 8

Numbers 0, 1, 2, and 3 are wiring numbers of the sensor used. For terminal numbers corresponding to R, IN+, IN–, I, refer to Terminal Base Unit Wiring Connections below.

The power supply for the current loop to the current inputs (R) is an isolated secondary (See Section 1). The power supply for the thermocouple inputs is an isolated secondary (See Section 1) and CJC to terminals 6 to 8. J are configured for thermocouples.

Input Map and Configuration (EDT)

The following information is presented for experienced users only. Refer to the user manual, publication 5080239-01, for complete information on programming and configuring your module.

Input Map (Read)

<table>
<thead>
<tr>
<th>Bit 15 – Bit 0</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000000000000000</td>
<td>Reserved for future expansion</td>
</tr>
</tbody>
</table>

Data Format

<table>
<thead>
<tr>
<th>Bit 15 – Bit 0</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1111111111111111</td>
<td>Reserved for future expansion</td>
</tr>
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</table>

Rt Ch n (Broken Input Mode Channel n)

<table>
<thead>
<tr>
<th>Bit 13</th>
<th>Bit 12</th>
<th>Bit 11</th>
<th>Bit 10</th>
<th>Bit 9</th>
<th>Bit 8</th>
<th>Bit 7</th>
<th>Bit 6</th>
<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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EDT Configuration Table

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DC Ch n (Disable CJC for Channel n)

<table>
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<th>Bit 13</th>
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<th>Bit 5</th>
<th>Bit 4</th>
<th>Bit 3</th>
<th>Bit 2</th>
<th>Bit 1</th>
<th>Bit 0</th>
<th>Result</th>
</tr>
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<td>1</td>
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<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
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Example of Voltage Wiring to a 1794-TB3G Terminal Base Unit

Input Map (Write)

<table>
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<tr>
<th>Bit 15 – Bit 0</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000000000000000</td>
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Input Filter

| Bit 15 | Bit 14 | Bit 13 | Bit 12 | Bit 11 | Bit 10 | Bit 9 | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 | Result |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Filter |

Data Format

| Bit 15 | Bit 14 | Bit 13 | Bit 12 | Bit 11 | Bit 10 | Bit 9 | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 | Result |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Filter |

BIM Ch n (Broken Input Mode Channel n)

| Bit 13 | Bit 12 | Bit 11 | Bit 10 | Bit 9 | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 | Result |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Breakdown |

F Ch n (Temperature Units for Channel n)

| Bit 13 | Bit 12 | Bit 11 | Bit 10 | Bit 9 | Bit 8 | Bit 7 | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 | Result |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Temperature |

Output Filter
Specifications

Number of inputs: 8 channels

Specifications

Terminals/Enclosure

- 1 terminal block
- Enclosure type rating: None (open-style)
- Conducted RF immunity (non-operating)
  - IEC 61000-4-8: 80 MHz - 1 GHz, 10V/m with 1 kHz sine-wave 80%
  - IEC 61000-4-11: 80 MHz - 1 GHz, 10 V/m with 1 kHz sine-wave 80%

Thermal: 100 °C for Declarations of Conformity, Certificates and other certification details.

Certifications (when product is marked)
- ATEX Directive, compliant with:
  - EEx ib IIC T4
- UL Listed Industrial Control Equipment, certified for U.S. and Canada, See UL File E455458
- CE European Union 94/9/EC
- ATEX Directive, compliant with:
  - EN 50014-1: Potentially explosive atmosphere equipment, incorporating electrical equipment, and
  - EN 61326; Meas./Control/Lab., category A, non-operating
- EN 61000-6-2: Meas. - Non-operating
- EN 61000-6-3: Meas. - Non-operating
- EN 61000-4-2: Radiated Immunity
  - ESD immunity: 8 kV air discharges
  - EMI: ±10 V/m, ±100 V/m, ±50 V/m, ±1 V/m
  - Radiated Immunity: ±10 V/m with 1 kHz sine-wave 80% AM
  - ±10 V/m with 1 kHz sine-wave 80% FM
  - ±10 V/m with 1 kHz sine-wave 80% AM at 100 MHz
  - ±10 V/m with 1 kHz sine-wave 80% AM at 200 MHz
- EN 50082-2: Industrial Immunity
  - ±10 V/m with 1 kHz sine-wave 80% AM

Module Accuracy

- 1% ± 1 LSB

Current Sensitivity

- 4 mA range: ±0.5 mA ± 2.0 mA ± 0.1 mA
- 20 mA range: ±0.5 mA ± 2.0 mA ± 0.1 mA
- 100 mA range: ±0.5 mA ± 2.0 mA ± 0.1 mA

Resistance Sensitivity

- 500 Ω range: ±2.5 mL ± 5 mL ± 0.1 mL
- 10 kΩ range: ±10 mL ± 20 mL ± 1 mL

RTD Accuracy

- With 4.17 Hz filter
  - ±0.001% ± 0.005% ± 0.001%